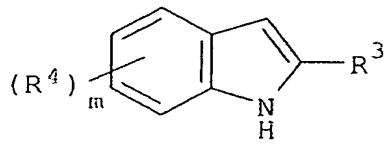
Patent Claims

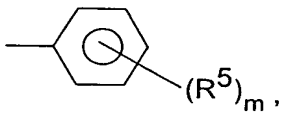
1. Stabilizer system for stabilizing halogen-containing polymers, comprising at least
a) one perfluoroalkanesulphonate salt and
b) at least one or more indoles and/or ureas and/or alkanolamines and/or aminouracils,

where the indoles have the general formula (I)



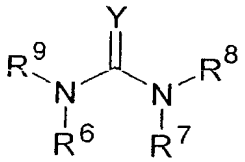
(I)

where
m = 0, 1, 2 or 3;
R^3 = C_1-C_{18}-alkyl, C_2-C_{18}-alkenyl, phenyl or



C_7-C_{24}-alkylphenyl, C_7-C_{10}-phenylalkyl or C_1-C_4-alkoxy;
R^4, R^5 = H, C_1-C_4-alkyl, or C_1-C_4-alkoxy;

where the ureas have the general formula (II)

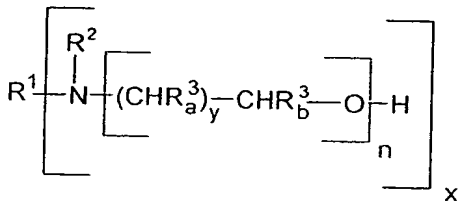


(II)

where
Y = O, S or NH;
R^6 , R^7, R^8 and R^9, independently of one another, are H, C_1-C_{18}-alkyl, where appropriate substituted with hydroxy groups and/or C_1-C_4-alkoxy groups, C_2-

C_{18}-alkenyl, phenyl, where appropriate substituted with up to 3 hydroxy and/or C_1-C_4-alkyl/alkoxy groups, C_7-C_{20}-alkylphenyl or C_7-C_{10}-phenylalkyl, and 2-substituents selected from R^6 to R^9 may also form a ring, and the urea used may also be a dimerized or trimerized urea, e.g. biuret or 1,3,5-tris(hydroxyalkyl) isocyanurate and possible reaction products of these,

where the alkanolamines have the formula (III)



(III)

where

x = 1, 2 or 3;

y = 1, 2, 3, 4, 5 or 6;

n = 1-10;

R^1 and R^2 = independently of one another H, C_1-C_{22}-alkyl, $-[-(CHR^3_a)_y-CHR^3_b-O-]_n-H$, $-[-(CHR^3_a)_y-CHR^3_b-O-]_n-CO-R^4$, C_2-C_{20}-alkenyl, C_2-C_{18}-acyl, C_4-C_8-cycloalkyl, which may have OH substitution in the β-position, phenyl, C_7-C_{10}-alkylphenyl or C_7-C_{10}-phenylalkyl, or if x = 1, R^1 and R^2 may also form, together with the N, a closed 4-10-membered ring of carbon atoms and, where appropriate, of up to 2 heteroatoms, or if x = 2, R^1 may also be C_2-C_{18}-alkylene which may have OH substitution at the two β-carbon atoms and/or may have interruption by one of more O atoms and/or by one or more NR^2 groups, or may be dihydroxy-substituted tetrahydrodicyclopentadienylene, dihydroxy-substituted ethylcyclohexanylene, dihydroxy-substituted 4,4'-(bisphenol-A-dipropyl

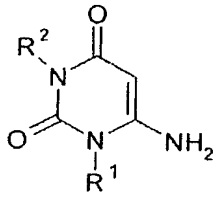
ether)ylene, isophoronylene, dimethylcyclohexanylene, dicyclohexylmethanylene or 3,3'-dimethyldicyclohexylmethanylene, and if x = 3, R^1 may also be trihydroxy-substituted (tri-N-propyl isocyanurate)triyl;

R^3_a and R^3b = independently of one another, C_1-C_{22}-alkyl, C_2-C_6-alkenyl, phenyl, C_6-C_{10}-alkylphenyl, H or CH_2-X-R^5, where X = O, S, -O-CO- or -CO-O-;

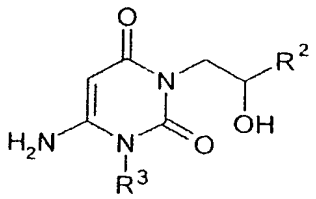
R^4 = C_1-C_{18}-alkyl/alkenyl or phenyl; and

R^5 = H, C_1-C_{22}-alkyl, C_2-C_{22}-alkenyl, phenyl or C_6-C_{10}-alkylphenyl,

and the aminouracils have the formula (IVa) or (IVb)



(IVa)



(IVb)

where in the case of (IVa) R^1 and R^2, independently of one another, are H, unsubstituted or C_1-C_4-alkyl-, C_1-C_4-alkoxy- and/or hydroxy-substituted phenyl, or are phenyl-C_1-C_4-alkyl which is unsubstituted or has C_1-C_4-alkyl, C_1-C_4-alkoxy and/or hydroxy substitution on the phenyl ring, C_3-C_6-alkenyl, C_5-C_8-cycloalkyl, or are C_3-C_{10}-alkyl interrupted by at least one oxygen atom, or are CH_2-CHOH-R^3, R^3 = H or C_1-C_4-alkyl, C_2-C_4-alkenyl, C_4-C_8-cycloalkyl, phenyl, C_7-C_{10}-alkylphenyl or C_7-C_{10}-phenylalkyl, and in the case of N- or N'-monosubstituted aminouracils R^1 or R^2 is also C_3-C_{22}-alkyl, and in the case of (IVb) R^2 = H or the radicals C_1-C_4-alkyl, C_2-C_4-alkenyl, or C_4-C_8-cycloalkyl, phenyl, C_6-C_{10}-alkylphenyl, C_7-C_{10}-phenylalkyl, -CH_2-X-R^4, where R^4 = H, a C_1-C_{10}-alkyl or a C_2-C_4-alkenyl radical or C_4-C_8-cycloalkyl,

where appropriate also containing an oxirane ring; or where appropriate substituted with from 1 to 3 C_1-C_4-alkyl radicals, or with a benzoyl radical or C_2-C_{18}-acyl radical, and X = O or S; R^3 = R^2 or R^4; C_2-C_6-alkyl substituted with an at least 1-5 OH groups and/or interrupted by at least 1 to a maximum of 4 O atoms, or is CH_2-$CH(OH)R^2$ for stabilizing chlorine-containing polymers.

2. Stabilizer system according to Claim 1, where the perfluoroalkanesulphonate salt is a compound of the formula $(C_mF_{2m+1}SO_3)_n$, where M is Li, Na, K, Mg, Ca, Sr, Ba, Sn, Zn, Al, La or Ce; and n is 1, 2 or 3, depending on the valency of M.

3. Stabilizer system according to Claim 1 or 2, where in the compound having the general formula (I) R^3 = phenyl, in the compound having the general formula (II), independently of one another, R^6, R^7, R^8 and R^9 = phenyl or H, in the compound having the general formula (III) n = 1, y = 2 or 3, in the compound having the general formula (IVa) R^1 and R^2 R^2 and R^1 is H and C_2-C_4-alkenyl or C_3-C_{10}-alkyl and in the compound having the general formula (IVb) R^3 = methyl or benzyl and R^2 = C_2-C_8-alkyl or C_3-C_6-alkenyl- or (C_1-C_8-alkoxy)methyl.

4. Stabilizer system according to any of Claims 1 to 3, where, in the perfluoroalkanesulphonate salt, M = Na or K and n = 1.

5. Stabilizer system according to any of Claims 1 to 4, where the compounds of the general formula (I) are 2-phenylindole or 2-phenyllaurylindole, the compounds of the general formula (II) are N,N'-diphenylthiourea, N-phenylurea, trishydroxyethyl or trishydroxypropyl isocyanurate, the compounds

of the general formula (III) are reaction products of NH_3, or of primary or secondary amines, in particular fatty amines, with ethene oxide, propene oxide, butene oxide or (thiol)glycidyl ethers in a molar ratio of 1:3, 1:2 or 1:1, or are reaction products of (thio)glycidyl ethers with alkanolamines, such as ethanol-, propanol- or butanolamines in a molar ratio of 1:2 or 1:1, in the compounds of the general formula (IVa) R^1 and R^2 or R^2 and R^1 are H and allyl, propyl and butyl, and in the compounds of the general formula (IVb) R^3 = methyl and R^2 = ethyl or allyoxymethyl.

6. Stabilizer system according to Claim 4, where, alongside the compounds of the formulae (I) to (III), at least one compound of the formula (IVa) is present, where $R^1 = R^2 = C_1$-C_{22}-alkyl or oleyl, and this aminouracil may moreover have been replaced entirely or to some extent by a corresponding structurally isomeric cyanoacetylurea.

7. Stabilizer system according to any of Claims 1 to 6, which also, where appropriate, comprises metal soaps and/or, where appropriate, comprises at least one or more other substances from the groups consisting of the polyols and disaccharide alcohols, glycidyl compounds, hydrotalcites, alkali metal/alkaline earth metal aluminosilicates, alkali metal/alkaline earth metal hydroxides, alkaline earth metal oxides or alkaline earth metal (hydrogen)carbonates, or alkali metal (alkaline earth metal) hydroxycarboxylates or metal carboxylates, phosphites, plasticizers, antioxidants, fillers, pigments, light stabilizers, lubricants and epoxidized fatty esters.

8. Stabilizer system according to any of Claims 1 to 7, where a phosphite is also present.

9. Composition comprising a chlorine-containing polymer and a stabilizer system according to any of Claims 1 to 8.

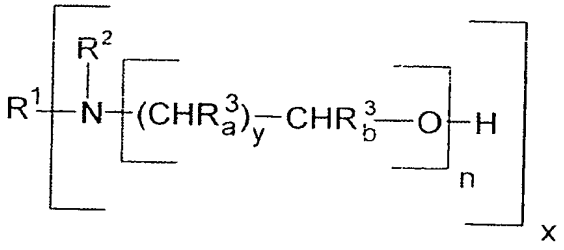
10. Composition according to Claim 9, characterized in that, based on 100 parts by weight of chlorine-containing polymer, there are from 0.01 to 10 parts by weight of the compounds of the general formula (I) and/or (II) and/or (III) and/or (IVa) and/or (IVb) and from 0.001 to 5 parts by weight of the perfluoroalkanesulphonate salt.

11. Process for stabilizing chlorine-containing polymers by adding a stabilizer system according to any of Claims 1 to 8 to the chlorine-containing polymer.

12. Consumer products comprising PVC which has been stabilized by a stabilizer system according to any of Claims 1 to 8.

13. Stabilizer system according to Claim 1, where component b is

(III)



for prestabilizing polyvinyl chloride.